

EXHIBIT 4

Not IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

TQ DELTA, LLC,

Plaintiff,

v.

CIV. A. NO. 2:21-CV-310-JRG
(Lead Case)

COMMScope HOLDING COMPANY, INC.,
COMMScope INC., ARRIS
INTERNATIONAL LIMITED, ARRIS
GLOBAL LTD., ARRIS US HOLDINGS, INC.,
ARRIS SOLUTIONS, INC., ARRIS
TECHNOLOGY, INC., and ARRIS
ENTERPRISES, LLC

Defendants.

TQ DELTA, LLC,

Plaintiff,

v.

CIV. A. NO. 2:21-CV-309-JRG
(Member Case)

NOKIA CORP., NOKIA SOLUTIONS AND
NETWORKS OY, and NOKIA OF AMERICA
CORP.,

Defendants.

NOKIA DEFENDANTS' ~~INITIAL-AMENDED~~ INVALIDITY CONTENTIONS (March 23, 2022)

Pursuant to this Court's Docket Control Order (Dkt. No. 62), Nokia Defendants Nokia Corporation, Nokia Solutions and Networks Oy, and Nokia of America Corporation (collectively, "Nokia" or "Nokia Defendants") respectfully submits these amended invalidity contentions and an accompanying document production with respect to the claims identified by Plaintiff TQ Delta, LLC ("TQ Delta") in its Preliminary Infringement Contentions.

NOKIA DEFENDANTS' INVALIDITY CONTENTIONS

Defendants reserve the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art, even if Nokia Defendants have not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

3. The Family 1 Patent Is Obvious Over the Prior Art.

To the extent TQ Delta argues that any limitation of the Asserted Claims of the Family 1 Patent are not explicitly disclosed and/or rendered obvious by an item of prior art identified above and in Exhibits F1-686A – F1-686K and F1 Secondary-686, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render such claims invalid as obvious under 35 U.S.C. § 103.

a) The Claims Are Obvious Over the Primary References in Light of One or More Secondary References.

To the extent the foregoing references are found not to anticipate and/or render obvious the Asserted Claims of the Family 1 Patent, the foregoing references render the Asserted Claims obvious, either alone or in combination with one or more of the other references identified above. One of ordinary skill in the art would have been motivated to combine the various references cited above and herein so as to disclose each and every limitation of the Asserted Claims of the Family 1 Patent.

Prior art references rendering the Asserted Claims of the Family 1 Patent obvious, either alone or in combination with other references in Exhibits F1-686A – F1-686K and F1 Secondary-686, are provided in the tables above and below and in Exhibits F1-686A – F1-686K and F1 Secondary-686. The prior art identified in Exhibits F1-686A – F1-686K render one or more

asserted claims of the Family 1 Patent obvious when the references are read in combination with one or more of each other, when read in combination with any of the prior art identified in Exhibit F1 Secondary-686, and/or when read in view of the state of the art and knowledge of those skilled in the art.

F1 Secondary Exhibit	Date
U.S. Patent No. 6,590,893 to Hwang (“Hwang”)	April 7, 1999
U.S. Patent No. 6,366,644 to Sisk (“Sisk”)	September 15, 1997
U.S. Patent No. 6,865,232 to Isaksson (“Isaksson”)	July 15, 1997
U.S. Patent No. 4,438,511 to Baran (“Baran”)	November 10, 1980
U.S. Patent No. 5,838,268 to Frenkel (“Frenkel”)	March 14, 1997
U.S. Patent No. 6,891,803 to Chang (“Chang”)	December 18, 1998
U.S. Provisional Application 60/078,549 to Jacobsen (“Jacobsen”)	March 19, 1998
Network and Customer Installation Interfaces – Asymmetric Digital Subscriber Line (ADSL) Metallic Interface (“T1.413-1995”)	August 18, 1995
Series G: Transmission Systems and Media, Digital Systems and Networks (“G.992.1”)	June 22, 1999
Data Communications Networking Devices: Operation, Utilization and LAN and WAN	January 1999

F1 Secondary Exhibit	Date
Internetworking, 4 th Edition, by Gilbert Held (“Held”)	
ADSL Forum Technical Report TR-024 (“TR-024”)	June 1999
<u>ITU-T Recommendation G.712</u>	<u>November 1996</u>

To the extent TQ Delta argues that any Asserted Claim of the Family 1 Patent is not disclosed or rendered obvious by any Exhibits F1-686A – F1-686K and F1 Secondary-686 reference, the Asserted Claims nevertheless would have been obvious in light of one or more other Exhibits F1-686A – F1-686K references and/or one or more references identified and charted in Exhibits F1 Secondary-686 and in view of the knowledge, experience, and understanding of persons of ordinary skill in the art.

Each and every reference identified is also relevant to the state of the art at the time of the alleged invention. Any of the references disclosed above may be combined with another to render obvious (and therefore invalid) each of TQ Delta’s Asserted Claims. Nokia Defendants may rely on a subset of (or all of) the above-identified references, including all references in Exhibits F1-686A – F1-686K and F1 Secondary-686, for purposes of obviousness depending on the Court’s claim construction, positions taken by TQ Delta during this litigation, and further investigation and discovery.

b) Exemplary Combinations of the Prior Art.

The table below provides an identification of exemplary combinations of prior art references that, based on Nokia Defendants’ present understanding of TQ Delta’s Preliminary Infringement Contentions and apparent reading of the Asserted Claims, render obvious one or

To the extent any item of prior art cited above is deemed not to disclose and/or render obvious, explicitly or inherently, any limitation of an Asserted Claim of the Family 2 Patents, the Nokia Defendants reserve the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art, even if Nokia Defendants have not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

3. The Family 2 Patents Are Obvious Over the Prior Art.

To the extent TQ Delta argues that any limitation of the Asserted Claims of the Family 2 Patents are not explicitly disclosed and/or rendered obvious by an item of prior art identified above and in Exhibits F2-193A - F2-193F, F2-601A – F2-601F, F2-014A – F2-014F and F2 Secondary-193, F2 Secondary-601, F2 Secondary - 014, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render such claims invalid as obvious under 35 U.S.C. § 103.

a) The Claims Are Obvious Over the Primary References in Light of One or More Secondary References.

To the extent the foregoing references are found not to anticipate and/or render obvious the Asserted Claims of the Family 2 Patents, the foregoing references render the Asserted Claims obvious, either alone or in combination with one or more of the other references identified above.

One of ordinary skill in the art would have been motivated to combine the various references cited above and herein so as to disclose each and every limitation of the Asserted Claims of the Family 2 Patents.

Prior art references rendering the Asserted Claims of the Family 2 Patents obvious, either alone or in combination with other references in Exhibits F2-193A - F2-193F, F2-601A – F2-

601F, F2-014A – F2-014F and F2 Secondary-193, F2 Secondary-601, F2 Secondary - 014, are provided in the tables above and below and in Exhibits F2-193A - F2-193F, F2-601A – F2-601F, F2-014A – F2-014F and F2 Secondary-193, F2 Secondary-601, F2 Secondary - 014. The prior art identified in Exhibits F2-193A - F2-193F, F2-601A – F2-601F, F2-014A – F2-014F render one or more asserted claims of the Family 2 Patents obvious when the references are read in combination with one or more of each other, when read in combination with any of the prior art identified in F2 Secondary-193, F2 Secondary-601, F2 Secondary - 014, and/or when read in view of the state of the art and knowledge of those skilled in the art.

F2 Secondary Exhibits	Date
ITU-T Recommendation G.992.1 (06/99) (“ITU-T G.992.1”)	June 1999
<u>ITU-T Recommendation G.997.1 (06/99) (“ITU-T G.997.1”)</u>	<u>June 1999</u>
U.S. Patent No. 6,002,670 to Rahman (“Rahman”)	December 12, 1997
U.S. Patent No. 6,956,872 to Djokovic (“Djokovic”)	August 18, 2000
U.S. Patent No. 6,665,733 to Witkowski (“Witkowski”)	September 23, 1997
U.S. Patent No. 6,772,388 to Cooper (“Cooper”)	December 6, 2000
<u>Alcatel A1000 ASAM ADSL</u>	<u>January 1999</u>

To the extent TQ Delta argues that any Asserted Claim of the Family 2 Patents is not disclosed or rendered obvious by any Exhibits F2-193A - F2-193F, F2-601A – F2-601F, F2-014A – F2-014F, the Asserted Claims nevertheless would have been obvious in light of one or more other Exhibits F2-193A - F2-193F, F2-601A – F2-601F, F2-014A – F2-014F references and/or

understood in the context of the reference itself, in conjunction with anything incorporated by reference or described as relevant technology by the reference, any documents that are referred to for further understanding by the reference, any system embodying the reference, and any testimony by those with knowledge of the reference, such as the named authors and inventors. Nokia Defendants may rely on uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions that are cited. Nokia Defendants may also rely on uncited portions of the prior art references, other disclosed publications, and the testimony of experts to establish that a person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

1. The Family 4 Patent Priority Date.

TQ Delta's Preliminary Infringement Contentions allege that the Asserted Claim of the Family 4 Patent is entitled at least to the priority date of November 9, 1999 or, in the alternative, November 9, 2000 or, in the alternative, August 26, 2005, or in the alternative, September 28, 2007, or, in the alternative, October 22, 2008. To the extent TQ Delta alleges that any prior art relied on in these invalidity contentions does not qualify as prior art to an Asserted Patent, Nokia Defendants reserve the right to rebut those allegations (*e.g.*, by demonstrating an earlier relevant date for the challenged prior art and/or a later priority date for the Asserted Patent and/or Asserted Claim).

2. The Family 4 Patent Is Anticipated and/or Rendered Obvious by the Prior Art.

The Asserted Claim of the Family 4 Patent is invalid as anticipated and/or rendered obvious under 35 U.S.C. §§ 102 and/or 103 in view of each of the primary prior art references identified in the claim charts included in Exhibits F4-008A – F4-008G; F4-008I – F4-008L; F4-008N – F4-

~~008PF4-008A—F4-008N~~, which identify specific examples of where each limitation of the Asserted Claim is found in the prior art references. As explained above, the cited portions of prior art references identified in the attached claim charts are exemplary in nature and representative of the content and teaching of the prior art references, and should be understood in the context of the reference as a whole and as they would be understood by a person of ordinary skill in the art.

Nokia Defendants identify the following references as anticipating and/or rendering obvious the Asserted Claim of the Family 4 Patent under 35 U.S.C. §§ 102 and/or 103. The table of anticipating and/or rendering obvious references below is exemplary, and it does not constitute an admission that any reference not listed below does not also anticipate and/or render obvious the claim of the Family 4 Patent. Further, Nokia Defendants contend that any prior art reference in the attached charts that is charted for each limitation of any given claim, anticipates that claim, regardless of whether that prior art reference is listed in the following table.

Exhibit	Primary Prior Art	Date ³
F4-008A	U.S. Patent No. 6,125,103 to Bauml (“Bauml”)	September 3, 1997
F4-008B	U.S. Patent No. 6,556,557 to Cimini (“Cimini”)	June 2, 1999
F4-008C	U.S. Patent No. 6,963,599 to Dunn (“Dunn”)	December 30, 1992
F4-008D	U.S. Patent No. 6,781,951 to Fifield (“Fifield”)	October 22, 1999
F4-008E	U.S. Patent No. 5,682,376 to Hayashino (“Hayashino”)	December 14, 1995

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³ Nokia Defendants reserve the right to identify additional bases for qualification as prior art for each of the identified references in the event that it is determined that the Asserted Patents are not entitled to the claimed priority date.

Exhibit	Primary Prior Art	Date ³
F4-008F	U.S. Patent No. 6,310,869 to Holtzman ("Holtzman")	August 31, 1998
F4-008G	U.S. Patent No. 6,301,268 to Laroia ("Laroia")	March 10, 1998
F4-008H	EP Patent No. 0743768 to Narahashi ("Narahashi")	December 4, 1995
F4-008I	U.S. Patent No. 6,625,219 to Stopler ("Stopler")	February 26, 1999
F4-008J	U.S. Patent No. 6,088,406 to Suzuki ("Suzuki 406")	August 20, 1997
F4-008K	U.S. Patent No. 5,903,614 to Suzuki ("Suzuki 416")	December 24, 1997
F4-008L	U.S. Patent No. 6,657,949 to Jones ("Jones")	July 6, 1999
F4-008M	EP Patent No. 0895389 to Williams ("Williams")	July 27, 1998
F4-008N	U.S. Patent No. 4,924,516 to Bremer ("Bremer")	May 23, 1989
F4-008O	"A Method to Reduce the Probability of Clipping in DMT-Based Transceivers" by Denis J. G. Mestdagh and Paul M. P. Spruyt ("Mestdagh")	October 1996
F4-008P	"A Comparison of Peak Power Reduction Schemes for OFDM" by Stefan H. Müller and Johannes B. Huber ("Müller")	1997

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To the extent any item of prior art cited above is deemed not to disclose and/or render obvious, explicitly or inherently, any limitation of the Asserted Claim of the Family 4 Patent,

Nokia Defendants reserve the right to argue that any difference between that prior art and the corresponding patent claim would have been either inherent in the art or obvious to a person of ordinary skill in the art, even if Nokia Defendants have not specifically denoted that the art is to be combined with the knowledge of a person of ordinary skill in the art.

3. The Family 4 Patent Is Obvious Over the Prior Art.

To the extent TQ Delta argues that any limitation of the Asserted Claim of the Family 4 Patent is not explicitly disclosed and/or rendered obvious by an item of prior art identified above and in Exhibits ~~F4-008A – F4-008G; F4-008I – F4-008L; F4-008N – F4-008P~~~~F4-008A – F4-008N~~ and F4 Secondary-008, any purported differences are such that the claimed subject matter as a whole would have been obvious to one skilled in the art at the time of the alleged invention, in view of the state of the art and knowledge of those skilled in the art. The item of prior art would, therefore, render such claims invalid as obvious under 35 U.S.C. § 103.

a) The Claims Are Obvious Over the Primary References in Light of One or More Secondary References.

To the extent the foregoing references are found not to anticipate and/or render obvious the Asserted Claim of the Family 4 Patent, the foregoing references render the Asserted Claim obvious, either alone or in combination with one or more of the other references identified above. One of ordinary skill in the art would have been motivated to combine the various references cited above and herein so as to disclose each and every limitation of the Asserted Claim of the Family 4 Patent.

Prior art references rendering the Asserted Claim of the Family 4 Patents obvious, either alone or in combination with other references in Exhibits ~~F4-008A – F4-008G; F4-008I – F4-008L; F4-008N – F4-008P~~~~F4-008A – F4-008N~~ and F4 Secondary-008, are provided in the tables above and below and in Exhibits ~~F4-008A – F4-008G; F4-008I – F4-008L; F4-008N – F4-008P~~

| Dated: ~~January 13~~ March 23, 2022

Respectfully submitted,

/s/ M. Scott Stevens

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CERTIFICATE OF SERVICE

Pursuant to Local Rule CV-5(c), the undersigned certifies that a true and correct copy of the foregoing document was served upon counsel for record via email on ~~January 13, 2022~~March 23, 2022.

/s/ M. Scott Stevens
M. Scott Stevens